



STATE TAX COMMISSION OF MISSOURI
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Cost of Capital Study

January 1, 2016

Staff Recommendation

Industry: Railroad Industry - Non Class I			SIC: 4002
Equity:			Reference
Risk Adjusted Models			
	CAPM	12.47%	Page 5
Dividend Growth Models			
	DGM or DCF Model (Dividend Growth)	11.75%	Page 7
	DGM or DCF Model (Earnings Growth)	9.25%	Page 7
	DGM or DCF Model (b * ROE = Growth)	15.25%	Page 7
Estimated Cost of Equity Capital		13.75%	
Debt:			
Estimated Cost of Debt Capital		5.50%	Page 3
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Cost of Capital Summary			
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Capital Component	Market Capital Structure	Cost of Capital	Before-Tax Weighted Average Cost of Capital
Debt	22.00%	5.50%	1.21%
Equity	78.00%	13.75%	10.73%
TOTAL	100.00%		11.94%
		Rounded	12.00%

Cost of Capital Study

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Staff Recommendation

Industry: Railroad Industry			SIC: 4002
Equity:	Direct Rate		Reference
	Estimated Cost of Equity Capital	6.25%	Page 8
Debt:			
	Estimated Cost of Debt Capital	3.51%	Page 9
Cost of Capital Summary			
Capital Componer	Market Capital Structure	Cost of Capital	Before-Tax Weighted Average Cost of Capital
Debt	22.00%	3.51%	0.77%
Equity	78.00%	6.25%	4.88%
TOTAL	100.00%		5.65%
		Rounded	5.75%

Cost of Capital Study
January 1, 2016
Analysis of the Market Capital Structure
Analysis of Debt Capital

Industry: Railroad		Ratings	
Company	Ticker	Moody's	S&P
American Railcar	ARII	NR	BB-
Can. National Railway	CNI	A2	A
Can. Pacific Railway	CP	Baa1	BBB+
CSX Corp.	CSX	Baa1	BBB+
GATX Corp.	GMT	Baa2	BBB
Genesee & Wyoming	GWR	Ba2	BB
Greenbrier (The) Cos.	GBX	NR	BB-
Kansas City Southern	KSU	Baa3	BBB-
Norfolk Southern	NSC	Baa1	BBB+
Trinity Industries	TRN	Ba1	BBB-
Union Pacific	UNP	A3	A
Overall Average Debt Rating		Baa	BBB

NR = Not Rated

Mergent Bond Record, Jan 2016, Page 208				
Corporate	Aaa	Aa	A	Baa
October	3.95%	4.11%	4.33%	5.34%
November	4.06%	4.21%	4.43%	5.46%
December	3.97%	4.16%	4.38%	5.46%
Average	3.99%	4.16%	4.38%	5.42%
Public Utilities	Aaa	Aa	A	Baa
October		4.13%	4.29%	5.47%
November		4.22%	4.40%	5.57%
December		4.16%	4.35%	5.55%
Average		4.17%	4.35%	5.53%
Industrials	Aaa	Aa	A	Baa
October	3.95%	4.08%	4.37%	5.21%
November	4.06%	4.20%	4.45%	5.34%
December	3.97%	4.16%	4.40%	5.36%
Average	3.99%	4.15%	4.41%	5.30%
Debt Yield Rate Estimate:				5.50%

Ratings Dispersion & Averages			
Agency	Number of Companies		
S&P			
AAA	1		
AA	2		
A	3	2	6
BBB	4	6	24
BB	5	3	15
B	6		
CCC	7		
C	9		
D	10		
Total:		11	45
Average Rating:			4.09
Moody's			
Aaa	1		
Aa	2		
A	3	2	6
Baa	4	5	20
Ba	5	2	10
B	6		
Caa	7		
Ca	8		
C	9		
Total:		9	36
Average Rating:			4.00

Cost of Capital Study
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Analysis of the Market Capital Structure

Industry: Railroad									SIC: 4002
Company Name	Stock Symbol	Debt (\$ mil)	Debt %	Stock Price	Shares Outstanding	Equity (\$ mil)	Equity %	Total Capital (\$ mil)	
American Railcar	ARII	298.3	22.38%	48.34	21.4	1,035	77.62%	1,332.8	
Can. National Railway	CNI	6,469.0	11.80%	61.40	787.2	48,334	88.20%	54,802.8	
Can. Pacific Railway	CP	6,427.0	20.51%	162.76	153	24,902	79.49%	31,328.6	
CSX Corp.	CSX	10,683.0	26.20%	31.17	965.5	30,099	73.80%	40,781.7	
GATX Corp.	GMT	4,195.8	64.73%	51.72	44.2	2,286	35.27%	6,482.0	
Genesee & Wyoming	GWR	1,548.1	26.82%	78.21	54	4,224	73.18%	5,771.7	
Greenbrier (The) Cos.	GBX	326.4	19.23%	47.44	28.9	1,371	80.77%	1,697.3	
Kansas City Southern	KSU	2,045.0	16.24%	97.19	108.5	10,545	83.76%	12,589.6	
Norfolk Southern	NSC	9,393.0	25.56%	91.88	297.8	27,362	74.44%	36,755.2	
Trinity Industries	TRN	3,369.9	43.36%	28.27	155.7	4,402	56.64%	7,771.5	
Union Pacific	UNP	13,607.0	13.98%	98.61	849.2	83,741	86.02%	97,347.7	
Totals:		58,362.5				238,298		296,660.9	
Weighted Mean			19.67%				80.33%		
Mean:			26.44%			39,716	74.13%	49,443	
Median:			22.38%				77.62%		
Market Capital Structure Estimate:		Debt:	22.00%			Equity:	78.00%		

Stock Price = 2015 Average Closing Price

Data Source: Value Line Investment Survey

Cost of Capital Study
January 1, 2016
Capital Asset Pricing Model (CAPM)

$$\text{CAPM} \Rightarrow K_e = R_f + (\beta * \text{ERP})$$

Industry: Railroad	SIC: 4002
Risk-Free Rate (R_f)	3.50%
Beta (β)	1.30
Equity Risk Premium (ERP): ($R_m - R_f$)	6.90%
Adjusted Equity Risk Premium: ($\beta * \text{ERP}$)	8.97%
Cost of Equity Capital - CAPM	12.47%
Morningstar SBBI Presentation 1926 - 2015	
Long-Term Government Bonds - Income Return ¹	5.00%
Intermediate Term US Treasury Coupon Note Yield (5-Year) ¹	4.50%
Short-Term US Treasury Bill Yield (30-Day) ¹	3.50%
Long-Term Horizon Expected Equity Risk Premium ² (Large Compay Stock Total Return - Long-Term US Government Bond Income)	6.90%
¹ SBBI Summary Statistics of Annual Returns (1926-2015), Arithmetic Mean, p. 6	
² Building Blocks for Expected Return Construction (1926-2015), p. 7	
Federal Interest Rates - IRS.gov, January 2016 Weighted Average Rates	
Long Term Treasury (30 year) ¹	3.12%
Composite Corporate Bonds ²	4.32%
¹ http://www.irs.gov/Retirement-Plans/Weighted-Average-Interest-Rate-Table	
² http://www.irs.gov/Retirement-Plans/Composite-Corporate-Bond-Rate-Table	
The ValueLine Investment Survey, Selected Yields, Page 3821, January , 2016	
U.S. Treasury Securities:	
5-year	1.79%
10-year	2.31%
30-year	3.04%
30-year Zero	3.17%
Federal Reserve Statistical Release (http://www.federalreserve.gov/Releases/H15/20160104/) 1//2016	
Treasury constant Maturities:	
5-year	1.78%
10-year	2.29%
20-year	2.66%
30-year	3.01%
Risk-Free Rate of Return R_f Estimate:	3.50%

Cost of Capital Study

January 1, 2016

Beta (β) Analysis

Industry: Railroad		SIC: 4002
Company Name	Stock Symbol	Beta " β "
American Railcar	ARII	1.50
Can. National Railway	CNI	1.00
Can. Pacific Railway	CP	1.15
CSX Corp.	CSX	1.20
GATX Corp.	GMT	1.15
Genesee & Wyoming	GWR	1.35
Greenbrier (The) Cos.	GBX	2.05
Kansas City Southern	KSU	1.20
Norfolk Southern	NSC	1.05
Trinity Industries	TRN	1.70
Union Pacific	UNP	1.05
Mean:		1.31
Median:		1.20
Beta (β) Estimate:		1.30

NMF = Not Meaningful

Data Source: Value Line Investment Survey

Cost of Capital Study
January 1, 2016
Dividend Growth Model (DGM or DCF)

$$\text{DGM or DCF Model} \Rightarrow K_e = \frac{D_1}{P_0} + g$$

where
K_e = Cost of Equity
D₁ = Expected Dividends
P₀ = Current Price
g = Sustainable Growth

Industry: Railroad												SIC: 4002
Company Name	Stock Symbol	Stock Price P ₀	Expected Dividend D ₁	Dividend Yield (D ₁ / P ₀)	Dividend Growth g	Earnings Growth g				(Dividends) K _e	(Earnings) K _e	g=(b * ROE) K _e
							b	ROE	g=(b * ROE)			
American Railcar	ARII	48.34	1.60	3.31%	9.50%	1.50%	65.68%	20.09%	13.20%	12.81%	4.81%	16.50%
Can. National Railway	CNI	61.40	1.08	1.76%	10.00%	6.50%	72.18%	23.94%	17.28%	11.76%	8.26%	19.04%
Can. Pacific Railway	CP	162.76	1.01	0.62%	9.00%	11.50%	86.07%	33.88%	29.16%	9.62%	12.12%	29.78%
CSX Corp.	CSX	31.17	0.72	2.31%	8.00%	7.00%	65.14%	16.86%	10.98%	10.31%	9.31%	13.29%
GATX Corp.	GMT	51.72	1.60	3.09%	5.50%	8.00%	68.77%	15.10%	10.38%	8.59%	11.09%	13.48%
Genesee & Wyoming	GWR	78.21	-	0.00%	0.00%	6.50%	100.00%	9.89%	9.89%	NMF	6.50%	9.89%
Greenbrier (The) Cos.	GBX	47.44	0.80	1.69%	21.50%	1.50%	91.45%	26.31%	24.06%	23.19%	NMF	25.75%
Kansas City Southern	KSU	97.19	1.32	1.36%	10.50%	10.00%	71.66%	12.67%	9.08%	11.86%	11.36%	10.44%
Norfolk Southern	NSC	91.88	2.36	2.57%	4.00%	7.00%	54.18%	12.76%	6.91%	6.57%	9.57%	9.48%
Trinity Industries	TRN	28.27	0.44	1.56%	9.00%	4.00%	91.98%	22.63%	20.82%	10.56%	5.56%	22.37%
Union Pacific	UNP	98.61	2.20	2.23%	9.50%	8.50%	50.15%	22.71%	11.39%	11.73%	10.73%	13.62%
Mean:				1.83%	9.07%	6.07%	78.47%	20.87%	16.42%	11.70%	8.93%	16.69%
Median:				1.76%	9.00%	6.50%	72.18%	20.09%	13.20%	11.14%	9.44%	13.62%
Cost of Equity Capital - DCF K_e Estimate:										11.75%	9.25%	15.25%

NMF = Not Meaningful

b = (1 - payout ratio) = Retention Ratio

ROE = Return on Book Equity

Stock Price = 2015 Average Closing Price

Data Source: Value Line Investment Survey

Support for Market Multiples
Railroad
2016 Assessment Year

Industry Overall				
Company Name	Ticker	\$Stock\$ Average	Earnings	P/E Multiple
American Railcar	ARII	48.34	4.66	10.37
Can. National Railway	CNI	61.40	3.2	19.19
Can. Pacific Railway	CP	162.76	7.27	22.39
CSX Corp.	CSX	31.17	2	15.59
GATX Corp.	GMT	51.72	4.34	11.92
Genesee & Wyoming	GWR	78.21	4.1	19.08
Greenbrier (The) Cos.	GBX	47.44	5.93	8.00
Kansas City Southern	KSU	97.19	4.5	21.60
Norfolk Southern	NSC	91.88	5.11	17.98
Trinity Industries	TRN	28.27	4.19	6.75
Union Pacific	UNP	98.61	5.41	18.23
Mean:				15.55
Median:				17.98
Weighted Mean:				15.72
P/E Estimate:				16.0
Equity Rate:				6.25%

NMF = Not Meaningful

Stock Price = 2015 Average Closing Price

Note: Units per share comparisons

Data Source: ValueLine Investment Survey

Cost of Capital Study
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Direct Debt Rate Calculation

Industry: Railroad		
Direct Capitalization Debt Rate		
Interest Expense		\$ 2,046.0
Total Value of Debt (TVD)		\$ 58,362.5
Current Yield = Interest Expense/TVD		3.51%

\$ (millions)

Data Source: ValueLine Investment Survey